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ABSTRACT

A brief analysis of conceptual learning in adult education and some philosophical implications for the practitioner are presented. This review traces the intellectual and political growth in the adult education movement. It lists recent seminal studies in the field and presents a series of relatively non-technical interpretations. The analysis of the literature is concerned primarily with the more basic question of whether the adult educator should attempt to incorporate conceptual learning into his practice. It concludes that some practitioners may be justified in rejecting conceptual learning if it is in conflict with their basic philosophies and life styles, while others may find much of value in it. (Author/CK)

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**CONCEPTUAL LEARNING:
FROM MOLLUSKS
TO ADULT EDUCATION**

BY: ROBERT A. CARLSON

Syracuse University
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and
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FROM MOLLUSKS TO ADULT EDUCATION

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March, 1973

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PREFACE

Every generation has its new approaches to education. Whatever else the current generation contributes to education, there is one worthwhile emphasis it has given, that of conceptual learning.

Conceptual learning is not indigenous to our times, but it has received a new thrust as part of the overall heuristic movement in American education and deserves the serious attention of adult educators. Indeed, many adult educators have been discussing conceptual learning at seminars, conventions, and informal gatherings in order to get a greater insight into its workings and application to the field.

Robert Carlson -- an adult educator and historian -- has searched through the sparse literature on conceptual learning in adult education, has put together a brief analysis, and suggested some philosophical implications for the practitioner. His efforts should assist teachers in thinking through the use of conceptual learning and its application to adult programs.

Although Carlson made an effort to be rather comprehensive in reporting the findings of his search, it ought to be noted that gaps which exist for the reader are probably the result of the author's prerogative to be selective.

The profession is indebted to Robert Carlson for his scholarship in the preparation of this review. Members of the profession are invited to offer suggestions for the improvement of the review.

Thanks are also due to Bea Marcks for typing the manuscript and to Doris Chertow and the Syracuse University Publications in Continuing Education for making this publication available more widely.

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HISTORICAL AND PHILOSOPHICAL ANALYSIS OF CONCEPTUAL LEARNING IN ITS INTELLECTUAL AND POLITICAL CONTEXT

"I want to organize a concept circus. I want concepts jumping through hoops, balancing on tight-ropes, and clowning about. I want concepts up on their hind legs, and doing other peculiar things which concepts were never meant to do."

-Edward De Bono, a conceptual learning
advocate, writing in The Times Educational
Supplement, 1971

Introduction

Every so often an idea comes along which shakes the halls of education. It is usually presented as an innovation whether or not the idea is particularly new. On the basis of recent events, it seems reasonable to assume that conceptual learning will likely become the next idea to receive aggressive promotion as an "innovation" for adoption by the forward-looking adult educator.

Advocacy of conceptual learning is already underway in adult education, usually in the name of improved efficiency. It is argued with force and logic that learning by concepts enables the adult education participant to find meaningful relationships among ideas. It avoids wasting time learning masses of isolated facts about a subject. "By a careful analysis of the structure of knowledge," proponents contend, "it is possible to discover certain key concepts distinguished by their power to epitomize important common features of a large number of more particular ideas. Such concepts are basic central ideas an understanding of which opens the door to an effective grasp of the entire field of knowledge" (42). To further learning efficiency, according to this theory, the adult educator should ferret out and teach the key ideas regarding the subject matter at hand. Such a relatively simple and powerful argument is likely to provide the conceptual learning movement with its day in adult education just as it has done already on other levels of education.

This literature review proposes to offer the practitioner and student of adult education an overview of conceptual learning. It will trace the movement's intellectual and political growth. It will list recent seminal studies in the field and present a series of relatively non-technical interpretations of them. It will pinpoint the small amount of literature thus far produced relating conceptual learning directly to adult education. Perhaps most important of all, it will suggest a number of philosophical implications behind conceptual learning, implications which the adult educator may wish to consider in deciding whether or in what form to adopt such a point of view.

The purpose of this literature review is to provide the student and practitioner of adult education with an historical-philosophical perspective regarding conceptual learning. It is not a "how to" analysis although much of the remarkably skimpy literature on how to teach conceptually

is included. The analysis of the literature is concerned primarily with the more basic question of whether the adult educator should attempt to incorporate conceptual learning into his practice. It concludes that some practitioners may be justified in rejecting conceptual learning if in conflict with their basic philosophies and life styles, while others may well find much of value in it.

This review will deal with conceptual learning both as a tool used by practitioners of adult education and as a way of organizing the content of the field of adult education for training the practitioners themselves. These two areas are aspects of the same larger issue. Examples will be drawn from both these areas in analyzing the overall issue of conceptual learning in adult education.

Development of interest in conceptual learning for adult education will be traced to its popularity in schooling and in the subject matter fields. A brief history of conceptual learning in schooling will be presented to highlight the influence of the school in this area. It will facilitate a partial listing of promotional literature for conceptual learning related to specific subject matters, a literature that may be of value to some in adult education. Most important of all, the brief background of conceptual learning in schooling to be presented here will provide adult educators with a study that suggests caution regarding the adoption of approaches associated with it.

Experiential Learning Influential in Adult Education

In recent years the leadership in adult education has been under the sway of another forceful idea -- a notion that may be termed experiential learning. It has been called many things, including the discussion method, the laboratory method, group dynamics, and group processes. Its roots in North America could be traced to the educational philosophy promulgated by the influential John Dewey. Widely practiced and advocated prior to World War II by seminal practitioners of adult education such as Eduard Lindeman and vigorously promoted after the war by the group dynamics movement, this approach tended to put the adult and his life experiences ahead of any body of knowledge or so-called discipline of learning. It has inclined to view the adult as a relatively autonomous individual whose experience is crucial in making sense out of his life, his job, his leisure, his world, or whatever subject area he chooses to study via an institution of adult education. In experiential learning theory the individual learner and his opinions take priority over all other factors, including subject matter.

The high visibility level of experiential learning within adult education gave the field a reputation as a relatively open enterprise but caused academic embarrassment for some analysts of the field (1). Critics characterized the discussion method as a pooling of ignorance. They feared that the laboratory approach functioned without a proper intellectual

content or theoretical base. Despite the efforts of such subject-matter-oriented critics, experiential learning continued to dominate at the leadership level in adult education.

After 1964, however, a smattering of materials appeared relating conceptual learning theory directly to the field of adult education (6-16, 63, and 65-67). Responsible in part for this development was the increasing interest of schoolmen in programs to "upgrade" the adult poor. Many of these schoolmen had already been deeply influenced by conceptual learning notions that abounded in the literature and the rhetoric of their work with young people in the schools. It was natural that they might attempt to apply these notions to their adult clientele. As public moneys came more into use for adult education, furthermore, it seemed increasingly necessary to provide the public with at least the illusion of proof that the programs were efficient, economical, and successful. This flirtation by adult education with what schoolmen called accountability also helped to further the field's involvement in conceptual learning, an approach that possessed more potential than experiential learning for providing appearances of academic rigor and economic soundness.

There was also a crucial need at this time for an image of academic rigor in university programs for the training of adult education practitioners. In the late 1960's and early 1970's the leadership in the field was pressing for a wider acceptance of adult education as a university discipline. It was difficult to get tradition-bound faculties to admit a field that advocated what they thought of as the "soft pedagogy" of experiential learning. Conceptual learning offered a convenient "hard" terminology. Increasing amounts of literature after 1964 sought to identify the "core concepts" of adult education, an approach likely to win friends in academic circles. Conceptual learning thus began to take hold at some points of intellectual leadership within the adult education profession.

Conceptual Learning Popular In Schooling

Conceptual learning, however, was not a particularly new idea. Although even today there is little agreement on the exact meaning of the word "concept," notions of concept learning and categorizing have been around at least since the time of Aristotle (83). Psychological research had been going on in the area since the latter part of the nineteenth century. While the study of thinking faded between the two world wars, being confined for the most part to IQ testing, it returned to prominence after World War II (81). In the quarter of a century following the close of the war, concerns regarding thinking generally and conceptual learning specifically went far beyond the laboratories. Indeed, the application of conceptual learning to schooling had been widely advocated in the decade of the 1960's and even had some visible achievements in the subject areas of mathematics and science.

Conditions in North American schooling by 1960 proved extremely favorable to the introduction of such an approach. Schoolmen had experienced slashing attacks during the 1950's from critics whose philosophies of education were unsympathetic to the dominant view of the times. They equated the educational philosophy of John Dewey as it was interpreted in the schools by proponents of "life adjustment education" with a weak, mushy, wooly-headed pedagogy.

These commentators called for a "return to excellence" in education. Albert Lynd, Arthur Bestor, Hyman Rickover, Hilda Neatby, and others flayed educators for neglecting standards of excellence and traditional subject matter for classes that wrongly sought to "meet individual needs" and to socialize children to norms the educational establishment agreed were "democratic" (2-5). Lynd complained that educational process, based on real and felt needs of the students, had pushed aside the subject matter of history, literature, science, mathematics, and foreign languages. It had replaced these traditional subjects with what Lynd and the others felt was the watered-down curriculum of social studies, home and family life education, and vocational, recreational, personality, and etiquette training. Demands rained down upon schoolmen and professors of education to discard Deweyan approaches, some of which the critics correctly disparaged as having degenerated into "social processing."

With the launching of Sputnik by the Russians in October of 1957, the critics' words became enshrined as spoken in "the national interest." Public opinion fell in behind the critics. The more philosophically "up-to-date" the schoolman was the farther he was sent reeling. One does not switch philosophies overnight, however, and still maintain integrity. Such considerations forced many schoolmen to confront the practical political necessity of how they could convince public opinion that the republic would remain secure while they maintained their philosophical commitments to Dewey, to education for socialization, to learning by doing, to teaching children rather than subjects, to the notions of felt and unfelt needs, to growth, to development, to discovery, and to discussion. Preserving these values in schooling meant that the education profession required some new approach and, above all, a new label to replace the discredited "progressive education" associated with Dewey.

Jerome Bruner To The Rescue

Out of his psychology laboratory sprang Jerome S. Bruner in 1960 with the required label in hand. Bruner was the major publicist for conceptual learning and the man who rescued the schoolmen and the basic elements of their Deweyan philosophy. In less than 100 easy-to-read and pocket-sized pages Bruner's The Process of Education argued for basing education on those "key concepts" he assumed were identifiable in the structure of any meaningful subject matter, on the readiness of the individual child to learn something at any age, on the value of intuitive

as well as other forms of thinking, and on interesting the child in the subject (22). Bruner's magic lay in his seeming ability to wed such Deweyan notions as individual freedom, socialization, growth, and involvement in learning with the traditionalist critic's commitment to the sanctity of the content and its use to discipline the individual. "What may be emerging as a mark of our own generation," Bruner wrote in 1960, "is a widespread renewal of concern for the quality and intellectual aims of education--but without abandonment of the ideal that education should serve as a means of training well-balanced citizens for a democracy."

Bruner walked a philosophical tightrope. He balanced his commitment to subject matter with an interest in the individual child's "readiness to learn" that matter at all the different levels of maturation. He argued for presenting the traditional topics in terms meaningful to a child at his given stage of development. Although the book was his report of a ten-day conference of thirty-five scholars and educators, it depended heavily on his own A Study of Thinking (24) and on the work of Swiss developmental psychologist Jean Piaget (31-36).

Bruner and Piaget were the two major figures in the study of conceptual learning in the post-World War II period. They built, of course, on previous research and on the work of others currently involved in such study. They worked with a number of collaborators in both their research and writing. None the less, insight into these two major figures should be sufficient to get a feel for conceptual learning and, most important, for some of the philosophical commitments underlying it.

Mollusks and "The Order of Things"

Bruner's commitment to intellectual learning showed clearly in The Process of Education and endeared him to the critics, but he also attended to the attitudinal side of learning. To maintain student interest, Bruner called for teaching that would enable students to discover for themselves some of the fundamental concepts identified by experts of the different disciplines. It would be exciting for the student himself to identify the "regularities of previously unrecognized relations and similarities between ideas." He argued that one of the concepts students should be carefully led to discover for themselves was the orderly nature of the universe, a metaphysical notion to which he himself seemed deeply committed.

This belief in the orderly nature of existence was common to both Bruner and Piaget. Indeed, despite Bruner's claim at age fifty-five that he believed reality was untidy, both came to beliefs in "the order of things" in their youth (31, 80). Piaget's case was particularly illuminating, as he himself acknowledged that his earlier metaphysical wrestlings had considerable impact on his psychological theory. He had studied biology and zoology as a young man and became committed to current notions underlying these disciplines. Based in part on his

doctoral study of mollusks, or sea shells, he extrapolated to all areas of life his commitment to evolution and morphology, his faith in the notion that from cell to society all life could be understood only in terms of structures and their whole-part relationships. He carried that mollusk-centered bias into his psychological studies of the thinking, perception, and learning of man.

This pair of psychologists was deeply interested both in knowledge and in how human beings acquired their knowledge. Piaget, who was seventy-five years old in 1971, found himself for more than the first quarter-century of his work involved primarily in studying how children learn. His direct applications of this work to a theory of knowledge that would have relevance for adults did not appear in any extensive written form until the 1950's. Bruner published his seminal study on thinking in 1956. His research was conducted largely upon Harvard undergraduate students, a group he quite properly identified as adult subjects. Soon after that study, however, he switched his interest to children. From 1960 on, there was much cooperation and interchange of personnel between the study center on cognitive learning headed by Piaget in Geneva and the one headed by Bruner in Cambridge, Massachusetts (23).

Both men and their colleagues added to the literature on conceptual learning, differing sharply at times (37,79). Piaget developed a structural theory of intelligence that stressed the individual child and his readiness to learn certain levels of abstractness at certain ages. Under Piaget's theory, one would have to wait to teach a child certain subjects. Bruner, on the other hand, emphasized a structural theory of subject matter more congenial to educational traditionalists. "We begin with the hypothesis," he wrote, "that any subject matter can be taught effectively in some intellectually honest form to any child at any stage of development." Their respective models of a child's intellectual development posited different numbers and types of stages. Despite these and other differences in theory, Bruner's The Process of Education was able to fuse his work, Piaget's findings, and the research and thought of many others interested in conceptual learning into a series of hypotheses for improved education.

From Action to Reaction in Schooling

The impact of the little book was vast. Schoolmen scrambled for their copies. The result of Bruner's report was general disparagement of the memorization of facts and the encouragement of an emphasis on teaching by concepts. To conceptualize, Bruner believed, "is to render discriminably different things equivalent, to group the objects and events and people around us into classes, and to respond to them in terms of their class membership rather than their uniqueness" (24). He advocated more research regarding the possible value of conceptual learning in the schools (22). Many of his readers, however, seemed ready to bypass such interim steps. What Bruner had termed "conjecture of how best to aid the teacher in the task of instruction" became in practice

"Bruner's Immutable Laws of Teaching." Virtually all the subjects in the school curriculum were lined up during the 1960's for inspection as to what constituted their "core concepts" (43-59).

No longer would American students waste time on meaningless details while the Russians explored outer space. Not only would Americans get to the moon first; they would do so by learning about it and other subjects more efficiently. No longer would school children learn as an isolated fact that the moon had an important effect on the tides. They now would discover this fact in the process of dealing with a broad and unifying concept such as Newton's law of universal gravitation. Or so the conceptual learning advocates seemed to assume.

Another concept or chain of concepts, however, would come to haunt Bruner and his colleagues in the United States as they promoted their approach to learning. They appeared to overlook the chain as they busily marshaled conceptual learning to the fore in the name of national security. What they disregarded was that for every action there is an equal and opposite reaction.

The reaction to conceptual learning got underway in the mid-1960's (69-80). That conceptual learning was an approach with value for some teachers no one denied. As early as 1964, though, Harper's Magazine was warning the public that Bruner's little book was simply a set of research proposals, not the "sort of bible" it was becoming to schoolmen (80).

A psychologist soon added his own "second thoughts on concepts" (69). Bernard Z. Friedlander of Western Reserve University, showing a traditionalist wariness of the Deweyan aspects of Bruner's thought, wondered about dangers in student freedom to discover relationships that were perhaps sometimes incorrect relationships. He also worried that many practitioners were unwisely emphasizing conceptual relationships to the exclusion of the rudimentary facts and skills he thought were required for such abstractions. While paying his professional respects to his colleague Bruner, Friedlander told teachers -- in an obvious reference to Bruner and his conceptual learning theory -- that they "would make a grave mistake to leave it entirely to others within the scholastic community to determine what innovations should be accepted and what rejected" in the area of thinking and learning.

Perhaps conceptual learning's greatest enemies were those who climbed on Bruner's bandwagon without understanding what he was about. There were many such souls. It got so bad that a serious-minded proponent of conceptual learning complained bitterly over the situation in an article titled "Concepts, Concepts, Concepts" (74). Richard F. Newton chastised schoolmen for dashing "madly about" using the word, concept, as a vogue word "while paying little attention as to how, when, and where it should be used." Facts were called concepts. Generalizations of a higher order than concepts were called concepts (62, 70).

Everything was called a concept. Bruner's theory was losing all meaning, as many schoolmen did what they had always done and now simply articulated it in the words of the new religion of conceptual learning.

The theory found application among some schools and among some teachers, but it did not have the overwhelming effect on the schools that its proponents seemed to envision. If schoolmen talked the new language they could impress many of the critics of schooling and go about their business. It may have been the bandwagon use of the rhetoric, or it might have been a recognition that the philosophical and research bases of conceptual learning were questionable. At any rate, by 1970 the ardor for conceptual learning in the schools seemed to be waning somewhat.

Meanwhile, Back at Adult Education

The intellectual leadership in adult education, in the meantime, blissfully continued its advocacy of community development, group dynamics, and sensitivity training. These so-called "soft" pedagogical (or is it andragogical?) techniques were begging for attack from traditionalists as adult education's version of life adjustment and Deweyan "progressivism."

Indeed, an attack had occurred in 1960, the very year that the little book of Bruner's thought was published. William and Renee Petersen provided a traditionalist critique of the field (1). They found that adult education was not in tune with their philosophy. They were shocked by the "unorganized, confused, chaotic" state of university adult education and appalled that such theoreticians as Roby Kidd believed "that this is as it should be." In their view, the field required "a minimum core of invariable consensus" more than it needed such virtues as "tolerance of others' views, flexibility, exciting experimentation, imagination, and creativity. . . ."

The adult educator's treatment of students as equals disturbed the Petersens' traditionalist notions of "professional authority." They assumed it was the role of the teacher, whether of adults or of children, to transmit knowledge and attitudes. What some adult educators viewed as an approach honoring adult autonomy the Petersens dismissed with such pejorative terms as "laissez-faire" or "anarchy."

As for the content of the field, the writers were aghast. They rejected community development as "noneducation." Much group discussion, they believed, emphasized group feelings rather than mastery of subject matter. In an appendix their colleague, Warren Rovetch, launched a withering traditionalist attack on the entire institution of Cooperative Extension as "anti-intellectual."

Instead of succumbing to the onslaught, as schoolmen had done, adult educators closed ranks against these "negative outsiders." Despite the vogue nature of their criticisms, the Petersens had overreached themselves politically. They had attacked group dynamics, sensitivity

training, community development, university extension, Roby Kidd, and worst of all, the cohesive Cooperative Extension Service, which tends to reject criticism from "outsiders." Their book was soon out of print.

The Petersens' publication, none the less, proved influential. While rejecting the messengers, adult education slowly took heed of their message.

With conceptual learning notions flooding through schooling in an attempt by schoolmen to meet traditionalist criticisms, it was probably inevitable that adult educators would want at least to get their feet wet. The Commission of Professors of Adult Education, in seeking to justify the field as worthy of university-level study, adopted the language of the conceptual learning vogue in 1964 (7). The Commission identified some elements it termed concepts which it thought were relevant for university study by practitioners and would-be practitioners in the field. Some research was carried out to investigate these and other concepts thought to have possible utility in adult education (6-16). But there seemed to be a cautious approach, a prudent reticence, among adult educators toward conceptual learning.

Reflecting the wariness was the 1971 publication by J. Paul Leagans and others which identified some concepts the authors considered to be of value to Cooperative Extension workers and other adult educators (10). They stated clearly that their presentation was not to be viewed as prescriptive. They were offering some speculations, "mental anchors" they called them, of elements in educational psychology and adult education that might have value in the training of practitioners. Before assuming prudent outcomes from such prudent language, however, it should be recalled that Bruner had identified as speculations those statements that set off the conceptual learning fad in schooling.

There are, of course, strong-minded and influential advocates of conceptual learning in adult education. Ralph Tyler has been the primary proponent within the field (16). He has long argued for the setting of behavioral objectives in adult education which can then be evaluated in some systematic way. And he is quite right in suggesting that intellectual learning can probably be evaluated with reasonable preciseness in such a behavioral way if the teacher or researcher defines "learnings to be obtained" in terms of specified concepts and their permutations. Conceptual learning, of course, need not be accompanied by a commitment to behaviorism. But, as a technique, it does lend itself admirably to Tyler and his behavioral approach to program planning.

Some Philosophical Considerations

In analyzing conceptual learning philosophically, it is necessary to distinguish between its employment as a theory and its use as a technique. A practitioner committed to experiential learning theory, for example, could practice conceptual learning approaches as a technique in certain

instances. Similarly, a practitioner committed to conceptual learning could practice experiential learning approaches as a technique. Conceptual learning approaches, however, have grown out of the theory and the philosophy on which that theory is based. Since the practice of any technique can influence one's own values and theory, the adult educator interested in conceptual learning either as a technique or as a theory should be aware of the philosophical assumptions upon which the theory rests.

It has been shown that conceptual learning assumes that man and his intellect evolve according to some orderly pattern and that all subject matter has an inherent order (22, 31). This is but one philosophical way of looking at reality. Just as much evidence, if not more, can be marshaled, for example, to prove that the nature of things is basically chaos and disorder. If the practitioner's metaphysics, then, deny such presuppositions as orderliness or evolution, it is probably inconsistent for him to operate on the conceptual learning theory.

On the other hand, a practitioner whose metaphysics deny the order of things might well utilize conceptual learning as a technique in some specific instance. It may simply be convenient at a certain point to deal with some data in conceptual learning terms. Having accepted the chaotic nature of things, such a practitioner might not worry about being consistent although he would need to studiously avoid cooptation by the theoretical and philosophical bases of the technique he uses.

The ethical dimension should probably be an equally important consideration with metaphysics and epistemology (the theory of knowledge) in an individual's educational philosophy. For his part, Jerome Bruner has found it easy to justify the ethics of conceptual learning theory. He has argued that it returned man to the center of learning in North America after some fifty years of dominance by Stimulus-Response psychological theory (26). To replace S-R's vision of the mind as an "empty box" with conceptual learning's vision of it as a "computer," however, may be considered by some as less than a giant step toward humanism (38). Conceptual learning's image of man is that of a computer in the process of becoming programmed with "proper knowledge" by educators. If one's ethical values are disturbed by such a vision of man inherent in conceptual learning, one should be wary of adopting the theory.

Even if one accepts the notion of the human being as a learning machine, however, there are still some serious questions that might be raised about conceptual learning. Can all subject matter be reduced to key concepts? Should all subject matter be reduced to key concepts when perhaps there may be certain areas of knowledge that do not lend themselves to conceptual learning? Are there instances, for example, when one must deal with the whole picture to grasp its meaning? To analyze a painting in an art appreciation class by packaging it into concepts could possibly damage both feeling and meaning and thus destroy the educational impact of this type of subject matter. Still another question within the values of the conceptual learning movement might be whether the sum of the same concepts is always the same. Does the "learning"

of concepts A, B, and C in that order result in the same understanding of the subject matter as if the concepts had been learned, for instance, in C, B, A, order?

Such questions, of course, tend to indicate a valuing of the philosophy underlying the conceptual learning movement. Such questions would logically tempt the one who posed them to conduct experiments to furnish his own answers. Depending upon his findings, the questioner would be likely to urge the practice of conceptual learning approaches in certain instances according to certain standard patterns and the rejection of them in others. He would then probably seek the best approaches, whatever they might turn out to be, for teaching that subject matter which did not lend itself to conceptual learning.

It is reasonable to assume that such action would flow from these questions, for they reflect a philosophy that those approaches which are the "most efficient" in furthering subject matter learning in the human mechanism in given general situations ought to be practiced by all educators in those situations. It is assumed that one technique will likely be the most effective approach in one situation while another technique will be the most effective approach in another situation. The factory's quest for "the one best way" of manufacturing each of its products thus becomes the educator's quest for "the one best way" of knowing each of the subject matters.

Philosophical analysis can enable the practitioner to avoid the first steps on a path he might reject if he knew where it could lead. It is quite legitimate to reject seemingly objective findings of scientific research by philosophically analyzing the values upon which the research was based and interpreting them, for example, as ethically lacking.

Any "factory approach" in adult education to which conceptual learning might contribute, however, would undoubtedly take considerable time to develop to its fullest "potential." There are other philosophical dimensions of conceptual learning that should be explored for their potential near-term consequence.

It is clear that conceptual learning theory has grasped a portion of epistemological truth in the area of program planning, but there may be danger that its practice to any great extent could overwhelm other truths and values that have given adult education a distinctive image in North American life. Any program in adult education can, of course, be described in conceptual learning terms. If one wishes to engage in such an exercise, all educational activity can be analyzed after the fact for the "key concepts" that were discussed, even if they were not identified as such at the time. The danger is that, having identified what are experienced as "key concepts" by one group at a given time and place, the adult educator then packages these notions as the truth to be presented to or "discovered" by all groups at any time and place. The adult educator thus ceases to be a fellow learner and reverts to the traditional

role of expert transmitter of sacred subject matter.

The role of the teacher as subject matter expert is precisely the expectation of at least a part of the theory of conceptual learning. A practitioner who assumes the primacy of the participant in adult education must be most careful in his adoption of a theory or his use of a technique that assumes a different order of priorities.

Conceptual learning theory tends to assume that efficient learning of subject matter is the primary purpose of education. Acceptance of such a notion means that learning tends to become the be-all and end-all of education. Conceptual syntheses are offered by experts to enable learners to get the subject matter "right" and get it fast. Yet, efficiency may not be the all-important criterion advocates of conceptual learning suppose. How adults go about their learning may be at least as important as what and how efficiently they learn. Ethical considerations that require the assumption of participant autonomy and primacy over the subject matter may prevent many practitioners, therefore, from adopting conceptual learning as a theory or as a technique.

Others Should Be Wary, Too

While educational traditionalists may favor conceptual learning's emphasis on subject matter and the teacher as expert, they too must be wary of the theory. It was shown that Bruner brought into juxtaposition the values of both traditionalism and Deweyism. Some values that are anathema to traditionalists, therefore, lurk within the theory. There would be nothing in Bruner's theory, for example, to prevent a practitioner from involving adult participants, or children for that matter, as part of the initial process of establishing what constitute the key concepts of a discipline, particularly if he could justify the move as an efficient approach under the circumstances. Such a "usurpation" of the expert's role, in traditionalist terms, is among a series of Deweyan "anti-intellectual" acts possible under Brunerian theory. Educational traditionalists, therefore, may be more comfortable in utilizing conceptual learning as a technique rather than adopting its overall theory.

Another aspect of conceptual learning should cause reflection by traditionalists and by those with other philosophical commitments. While traditionalists tend to favor conceptual learning as the discovery and labeling of certain eternal truths, the pragmatic side of Jerome Bruner and of the movement as a whole would tend to view the identified concepts as the created "truths of the moment" (24). Traditionalists would probably be deeply concerned that many advocates of conceptual learning interpret the theory as positing no universal truths. It thus becomes relativist, and relativism tends to be unacceptable and bothersome to traditionalists. What should bother many practitioners and administrators of adult education, whatever their philosophies, is conceptual learning's potential use as a technique for instilling these "truths" of the moment.

It is the Deweyan side of Bruner's thought which contains this potential

for "social processing" so long decried by traditionalist critics of "progressive" schooling. While theoretically affirming the freedom and autonomy of the individual learner, Deweyan thought also possesses a deep commitment to educating the individual for fitting happily and harmoniously into his society. This individual-society tension in Deweyan theory often gave way in the practice of compulsory schooling, resulting in what educational traditionalists properly identified as the dominance of the group over the individual in educational aims. Such a situation seldom occurred in adult education because adults generally paid for their own programs and could withdraw whenever they did not like what the educators were doing.

There is no reason why conceptual learning could not be used to teach efficiently the "truths" of the dominant political, economic, religious, or other faiths of the moment. Bruner himself saw his approach serving "as a means of training well-balanced citizens. . . ." As long as adult education remains voluntary and participant-supported, such social processing will be difficult. Given a change in this situation, however, the adult educator could well be expected to add and subtract from his concepts in the interest of whoever holds power and to use his efficient approaches to indoctrinate the new "truth," perhaps by the "discovery" method.

Adult educators need to be aware of the philosophical strengths and weaknesses of any theory or technique and to exercise caution in dealing with it. Few adult education administrators today would require a practitioner to justify his effectiveness in citizenship education on the basis of how much Latin and Greek he successfully inculcated. Yet, there was a day when that was the practice because the vogue theory equated good citizenship with the learning of these languages. Since neither the passage of time nor the improvement of research techniques have overcome the fact that theories are built on disputable philosophical assumptions, it should be equally suspect today to require a practitioner to justify his teaching on the basis of numbers and quality of concepts taught.

A popular theory or technique ought to be carefully considered by a practitioner before adoption to see if it fits his own philosophy and life style. The ethical, metaphysical, and epistemological bases of a theory or technique should, of course, mesh to a reasonable degree with the practitioner's own thinking, as has been discussed in some detail. Life style, too, is important. An individual adult educator who practices according to what may be termed an intuitive style, for example, may be well advised to reject the theory and even the technique of conceptual learning. To do otherwise may impose an analytical and orderly style that interferes with an intuitive approach.

While reading the annotated bibliography that follows, it would be well to keep in mind that adult education has a reputation for enabling a considerable degree of freedom in teaching and learning. It would be unfortunate if a quest for "efficiency" and academic respectability

were allowed to weaken that freedom. To be concerned over the potential dangers of modish theories or techniques such as conceptual learning is to face reality. One need only recall the history of conceptual learning in schooling. It is to be hoped, therefore, that practitioners and students of adult education will view all educational fads as they have tended, until 1972 at least, to view conceptual learning--carefully, critically, reflectively.

THE LITERATURE OF CONCEPTUAL LEARNING

The Literature of Discontent which opens this listing will provide the reader with the political and cultural context in which conceptual learning has developed in education. As in some other sections of this listing, the material directly related to adult education is featured even though such an approach disrupts to some degree the alphabetical order of the listing.

- (1) Renee and William Petersen, University Adult Education: A Guide to Policy (New York: Harper and Brothers, 1960). This seminal study offered a traditionalist critique of adult education carried on by American universities. It found that the field at the university level, clearly among the most systematic of all levels of adult education, contained "confusion, apparent contradictions and unresolved difficulties. . . ." Although its purpose was not to promote conceptual learning, the study offered criticisms that rested upon the same desire for order that underlay the theory of conceptual learning. The Petersen book thereby helped prepare the ground for a later introduction of the theory into adult education.
- (2) Arthur E. Bestor, Educational Wastelands: The Retreat from Learning in Our Public Schools (Urbana: University of Illinois Press, 1953). Bestor argued that schools existed to teach "the power to think," not to adjust students to their society. An historian of education in the United States, he took more accurate aim than many of the critics on the exponents of life adjustment education by attacking Charles Prosser rather than William Heard Kilpatrick or John Dewey. Bestor reflected perhaps an overabundance of self-confidence as an educator in describing the purpose of education. "We must remember, at all times," he wrote, "that education is concerned with improvement. It undertakes to change a man or a woman from what he is to what he or she might be and ought to be." One wonders what right Bestor or any educator has to try to "change" someone to be more like what he "ought to be." Bestor apparently experienced no such doubts and even had a blueprint of the desirable educational creation. One could sense that Bestor would likely see some value in Bruner's theory.
- (3) Hilda Neatby, So Little for the Mind (Toronto: Clarke, Irwin, and Co., Ltd., 1953). A Canadian critic, Hilda Neatby, centered her attack on John Dewey as the fountainhead of the evils of progressivism. Unlike many of the critics, she had no commitment to United States traditions of democracy. She expressed proclivities for Canadian liberalism, which she argued were based on virtues "practised before the appearance of modern democracy in the eighteenth century." She expressed concern that American-style democracy had replaced blind faith in a higher power with blind faith in reason. It had allowed an interest in equality and material well-being, she contended, to

degenerate into the mediocrity of egalitarianism and materialism. In this context she was correct in attacking Dewey rather than Prosser, for Dewey's arguments had contributed to weakening the philosophy to which she was committed. Prosser merely helped carry a part of Dewey's thinking into a particularly unacademic channel. But why attack rivulets when you can try to damn the source itself?

- (4) Albert Lynd, Quackery in the Public Schools (Boston: Little, Brown and Co., 1953). A preoccupation with education as a science, Lynd contended, had led to a surfeit of professional courses in the training of teachers and a downgrading of their preparation in subject matter fields. He called for redressing this imbalance. Lynd was particularly critical of the life adjustment emphasis in the schools. He incorrectly disparaged William Heard Kilpatrick as the "Grand Master" of the cult. Lynd's harsh but not undeserved criticisms were weakened by his support of the ouster of a California school superintendent as part of the anti-Communist hysteria of the time. The superintendent had been smeared as a "progressive" educator and associated thereby with Communism. Lynd saw the dismissal as a good democratic action.
- (5) Hyman G. Rickover, Education and Freedom (New York: E. P. Dutton and Co., Inc., 1960). This seminal publication provided a collection of speeches regarding the need to improve American education made during the 1950's by the father of the nuclear submarine. "The future prosperity and freedom of the Republic," Rickover asserted, depended on the return of education to its "traditional task." This, he claimed, was the "transmission of the nation's cultural heritage, and preparation for life through rigorous training of young minds to think clearly, logically, and independently." Rickover charged American educators with practicing the theories of Dewey and his disciples without a public mandate. These theories, he contended, changed "the objective of formal education from teaching basic subjects to conditioning children for group life."

The Literature of Advocacy, Theory-building and Research related to conceptual learning tended to thrive in the climate of opinion created by the literature of discontent.

Adult Education:

- (6) Edward Weldon Findlay, Curriculum Development for Professional Leaders in Extension Education, 300 N. Zeeb Rd., Ann Arbor, Michigan: University Microfilms (Ph. D. dissertation, Cornell University), 1969 (Order no. 70-3760). The study was based on the premise that if one is able to identify the areas of behavior in which professionals require competence, one can link this behavior to a related structure of concepts which may serve as logical teaching

and learning objectives in the development of training programs. A sample of 211 extension agents (in agriculture, home economics, and 4-H work) in thirty counties in New York State provided 149 incidents of behavior which identified the behavior thought to be critical to the achievement of effective or ineffective outcomes in extension activity. A structure of categories of agent behavior was developed and linked to the concepts within a structure of related concepts. The four functional areas derived were: systems, their growth and development; planned change and development; management of change and development, and influencing adoption and innovation. Use of the general systems concept as an ordering mechanism provided a general model or a series of models of aspects of the different functions and processes involved. It also supplied a way of perceiving the role of the extension agent within the general extension education process.

- (7) Gale Jensen, et. al., eds., Adult Education: Outlines of an Emerging Field of University Study (Washington, L.C.: Adult Education of the U.S.A., 1964). This publication by the AEA's Commission of Professors of Adult Education sought to justify the place of the field as a program of study in the university. It traced a background of the development of graduate departments of adult education to train professionals, and it outlined areas of knowledge the authors considered of value to practitioners. A series of elements important to the field were identified and termed concepts, including such items as adult, learning, education, objectives, program, processes, planning, agent, and evaluation.
- (8) Burton W. Kreitlow, Basic Explorations in Adult Re-education, Theoretical Paper No. 25 (Madison: University of Wisconsin Research and Development Center for Cognitive Learning, April, 1970). In this study designed to generate hypotheses concerning adult learning, cognitive processes, and the re-education of disadvantaged adults, the phenomena of concept attainment, symbol manipulation, verbal behavior, differential instruction, and awareness levels were investigated. Attention focus (cognitive style) in the concept attainment process was not satisfactorily measured. The symbol manipulation process of literate and illiterate adults varied sufficiently to suggest further testing. The verbal behavior of lower-class rural adult women was distinctly limited when compared with middle-class rural women in the same community. This suggested that differentiated instructional programs should be examined. A design for manipulating the instructional variables was developed for possible use in dealing with variance in the "awareness stage" of learning. This report summarized conditions which suggested investigation, the objects for preliminary explorations, and resultant findings.
- (9) Burton W. Kreitlow, Educating the Adult Educator: Part 1, Concepts

for the Curriculum, Bulletin No. 573 (Madison: University of Wisconsin College of Agriculture Experiment Station, March, 1965). Kreitlow studied the relationship of certain disciplines and fields of study to adult education. Material was obtained in several ways. Recent adult education research was reviewed and integrated with that cited in previous reviews, and recent research was surveyed in related disciplines and applied fields. Thirty-four selected leaders in the specified fields and disciplines were interviewed. Statements by professors of adult education were considered, and recommendations from a work conference of leading adult educators were synthesized. Findings pertained mainly to basic contributions of psychology and sociology in such areas as innovation, diffusion, adoption, aging, social class, leisure, adult learning, adult characteristics, motivation, educational methods, and educational leadership. Contributions from anthropology, economics, political science, communications, public school and higher education, school administration, social work, vocational and military training, and library science were limited but potentially important.

- (10) J. Paul Leagans, et. al., Selected Concepts from Educational Psychology and Adult Education for Extension and Continuing Educators (Syracuse, N.Y.: Syracuse University Publications in Continuing Education, 1971). The authors identified fifty-three concepts in educational psychology and twelve in adult education which seemed to offer the most usefulness to Cooperative Extension workers. The study's tentative suggestion that these concepts might have relevance to the entire field of adult education was based on the assumption that the jobs of Cooperative Extension workers were typical of the field, a debatable assumption.
- (11) Literacy House, Definitions and Concept of Functional Literacy: An Analysis and Interpretation (Lucknow, India: Literacy House, 1967). This study sought to outline the general consensus of sociologists, educators, planners, administrators, and social reformers in India as to the nature of adult literacy; to examine drawbacks (if any) in their concepts, and to analyze and harmonize different viewpoints on functional literacy. Differing concepts in the field at large were traced mainly to different goals -- economic development, vocational training, continuing education, productivity, and social participation. A dichotomy was also noted between literacy as a medium for communicating ideas and literacy as both a medium and an idea. Reactions of forty respondents were obtained concerning a definition put forth by UNESCO. The respondents were sharply divided as to the scope of literacy skills and the subject content of literacy education. A new definition based on the aim of making people more amenable to change was proposed and discussed.
- (12) William W. Metcalfe, Concepts of Education Held by Informal Adult Educators (Chicago, Illinois: University of Chicago Library [Ph.D.

dissertation], 1965). A study was made of concepts of education held by 304 male county agricultural extension workers in 186 counties of Illinois and Indiana. Measuring tools included a twenty-four item forced-choice schedule with typical activities of county extension workers. Rating involved the perceptions of superiors and the examination of three of each respondent's monthly narrative reports. Significant variations among the scores, as revealed by the Concept of Education Score, supported the hypothesis that there were identifiable differences among county extension workers as to the breadth of their concepts of education. Significant relationships were identified between only two of ten experimental factors involving educational and occupational or family experience and the breadth of educational concepts held by informal adult educators. The hypothesis that county extension workers who hold broad concepts of education will be more educationally oriented toward their professional responsibilities than those who hold narrow concepts of education was accepted on the grounds of significant correlations among the three educational orientation indexes.

- (13) Arthur H. Niehoff, Planned Change in Agrarian Countries (Springfield, Virginia: Clearinghouse for Federal Scientific and Technical Information, 1969). The report provided operational concepts and guidelines for persons responsible for planning and implementing development projects in agrarian countries. A framework for describing or evaluating the conduct of development projects was proposed and applied to the results of an analysis of 203 case studies of past projects. Influences, conditions, and techniques which appeared to affect project outcome were: 1) local cultural characteristics, such as leader patterns, social structure, and economic patterns; 2) motivation for change, including felt needs and perceived practical benefits; and 3) project strategies, such as the innovator's image characteristics, communication, and participation. The case study analysis suggested that factors of special importance to success in development projects were cooperation of local leaders, degree and immediacy of practical benefits which recipients anticipate, innovator skill in communication processes, participation of recipients in implementing the change, and establishing arrangements for maintenance of the innovation by the local people.
- (14) Shije Orham and Norma Radin, Teaching Mothers to Teach: A Home Counseling Program for Low-Income Parents (Ann Arbor, Michigan: University of Michigan School of Social Work, November, 1968). Twenty-four children attended a special half-day class when not attending regular kindergarten, while twelve of their mothers participated in a home counseling program. Children whose mothers were counseled achieved significantly higher on the Metropolitan Reading Test, and their mothers showed a significantly greater gain on the Cognitive Home Environment Scale. In bi-weekly home visits, parents were shown how to teach specific cognitive concepts

to support the curriculum to evaluate children's progress, and to motivate the children to become involved in the home education program. Approaches and techniques employed to abet parents' teaching skills were delineated in the report, and an evaluation of the program with recommendations for modifications was included.

- (15) Douglas H. Pletsch, Communications Concepts Used by Adult Educators in Agriculture to Implement Educational Change in Ohio (Columbus, Ohio: Ohio State University Department of Agricultural Education, May, 1968). Pletsch identified, defined, and applied communications concepts required by adult educators in agriculture to fulfill their role as change agents. An extensive review was made of the literature, related research, and opinions of specialists in communication, extension education, and vocational agriculture to predict behavior needed for future competence, identify relevant concepts from the behavioral sciences, and develop educational objectives. Analysis and refining produced thirty distinctive units or concepts. Real-life situations and examples were used to explain such major concepts as affective behavior, channel, commitment, language, message, persuasion, sender, and receiver. Finally, seven kinds of desired knowledge were discussed as guidelines for intensive study: communication as a dynamic process, the importance of communication concepts in educational change, the concepts themselves as related to agricultural education, the importance of the communicator in presenting valid information, sources of difficulties, the sender-receiver relationship, and qualities desirable for improving information dissemination.
- (16) Ralph W. Tyler, "Concepts, Skills and Values and Curriculum Development," speech given at Extension Curriculum Development Conference, Center for Advanced Study in the Behavioral Sciences, Washington, D.C., December 8-12, 1963. (For further information, write to R.A. Carlson, Associate Professor of Continuing Education, College of Education, University of Saskatchewan, Saskatoon, Saskatchewan, Canada.) Tyler argued that three types of learning exist, which he identified as conceptual learning, skill learning, and value learning. All three types, in Tyler's view, result in observable behavior change and are of value in education of a professional adult educator. Programs to prepare practitioners, he suggested, should teach selected concepts that would help explain a wide variety of phenomena. They should also teach, he wrote, such skills as problem-solving and group processes and such values as "objectivity toward new ideas" and the "conviction of the worth of every individual."

Selected Works of Jerome S. Bruner

- (17) Jerome S. Bruner, "The Act of Discovery," in his own collection of his writings On Knowing, Cambridge, Massachusetts: The Belknap

Press of Harvard University Press, 1962, pp. 81-96. Bruner saw discovery as the crucial method for teaching people to think. He defined discovery as the rearrangement of evidence in such a way that the learner could go beyond the evidence to new insights. He hypothesized that a discovery approach "helps the child to learn the varieties of problem solving, of transforming information for better use, helps him to learn how to go about the very task of learning."

- (18) Jerome S. Bruner, "After John Dewey, What?" in his own collection of his writings On Knowing, Cambridge, Massachusetts: The Belknap Press of Harvard University Press, 1962, pp. 113-126. Agreeing with Dewey's complaints against empty formalism in schooling, Bruner also condemned as "sentimentalism" Dewey's desire to fit subject matter to the interests of the child. "To attempt a justification of subject matter, as Dewey did, in terms of its relation to the child's social activities is to misunderstand what knowledge is and how it may be mastered." Subject matter, not the student, took priority in Bruner's scheme of things. ". . . The structure of knowledge -- its connectedness and the derivations that make one idea follow from another -- is the proper emphasis in education," he wrote.
- (19) Jerome S. Bruner, "The Course of Cognitive Growth," American Psychologist, XIX (January, 1964), pp. 1-15. In a brief, albeit technical manner, Bruner presented his theory of cognitive development in children. He discussed some of his research to support his thesis of the successive emergence in the child of action (enactive), image (iconic), and language (symbolic) as the vehicles of representation of recurrent environmental regularities. This is one of the best capsule presentations of Bruner's views on cognitive growth in children.
- (20) Jerome S. Bruner, "Education as Social Invention," Saturday Review XLIX (February 19, 1966), pp. 70-72 ff. Bruner followed a relatively non-technical explanation of his theory of child development with some suggestions for curriculum related to it. Education, he argued, should strengthen perceptual-imaginal capacities by improving "visualization -- whether related to the arts, to science, or simply to the pleasures of viewing our environment more richly." At the symbolic level, he wrote, education should provide "a conscious effort to lead children to verbal skills, to a sense of paraphrase and exchange." He saw a need for a prescriptive theory of how to teach for different ends-- "a theory that is neutral with respect to ends but exhaustive with respect to means."
- (21) Jerome S. Bruner, "Inhelder and Piaget's The Growth of Logical Thinking: A Psychologist's Viewpoint," British Journal of Psychology, L (November, 1959), pp. 363-370. Bruner lauded the publication of this new book, which analyzed the reasoning powers of 1500 Swiss children. While Bruner was excited about the differences found between the adolescent and the child, he wished the authors could have offered some insights into the qualitative nature of adult

intelligence as well.

- (22) Jerome S. Bruner, The Process of Education (New York: Vintage Books, 1960). In this influential book the author put forward his point of view that education should be instrumental to future achievement. He argued for the utility of "nonspecific transfers," i.e., the transfer of principles and attitudes learned to a series of subsequent different situations. "This type of transfer is at the heart of the educational process -- the continual broadening and deepening of knowledge in terms of basic and general ideas."
- (23) Jerome S. Bruner, et. al., Studies in Cognitive Growth (New York: John Wiley and Sons, Inc., 1966). This book presented a collection of papers by Bruner and his colleagues at the Center for Cognitive Studies in Cambridge, Massachusetts.
- (24) Jerome S. Bruner, et. al., A Study of Thinking (New York: John Wiley and Sons, Inc., 1956). This was Bruner's seminal study in the field of cognition. In the first part of the book the notion of conceptualizing was developed as a theory. A series of studies and experiments on concept attainment was then reported in support of the theory. In the last part of the book an associate of Bruner applied the theory of conceptualizing to the field of psycholinguistics.
- (25) Jerome S. Bruner, Toward a Theory of Instruction (Cambridge, Massachusetts: The Belknap Press of Harvard University Press, 1966). Operating on the assumption that instruction existed "to shape growth," Bruner sought a prescriptive theory of how to achieve the desired growth. Such a theory would provide "rules concerning the most effective way of achieving knowledge or skill" and a set of criteria for evaluating and criticizing any particular way of teaching or learning. A theory of instruction, he added, must also be "congruent with the theories of learning and development to which it subscribes." He saw four aspects necessary to a viable theory of instruction: 1) specification of experiences that would set a predisposition for individuals to learn, 2) specification of the most effective structuring of the body of knowledge for learning, 3) specification of the most effective sequences in which to present materials, and 4) specification of the nature and pacing of rewards and punishments in the process of learning and teaching.
- (26) Elizabeth Hall, "Bad Education -- A Conversation with Jerome Bruner," Psychology Today, IV (December, 1970), pp. 51-57 ff. This conversation gave insight into Bruner the human being. It briefly touched on the differences in theory between Bruner and Piaget. It showed Bruner's concern over dangers in the use of science and psychology. Of the popularity achieved by his The Process of Education, Bruner said, "I was really something of a fraud: I had been concerned directly with education for only a couple of years and had to carry the torch for many ideas that had only begun to be tried in practice."

Selected Works By and About Jean Piaget

- (27) D.E. Berlyne, "Recent Developments in Piaget's Work," British Journal of Educational Psychology, XXVII (February, 1957), pp. 1-12. This article briefly and effectively described Piaget's theory and research. It noted the methodological weaknesses in Piaget's so-called "clinical method" of research, adding that he improved his techniques considerably after his first five preliminary studies. Even with such methodological problems, Berlyne argued, "Piaget is, without any doubt, one of the outstanding figures in contemporary psychology, and his contributions will eventually have to be reckoned with much more than they are both in the management of children and in many areas which may not seem directly connected with child psychology."
- (28) John H. Flavell, The Developmental Psychology of Jean Piaget (Princeton, New Jersey: D. Van Nostrand Co., Inc., 1963). In the first and, to date, the best integrated overview of Piaget's theory and work, Flavell explained the multi-faceted interests of the man and some of the learning concepts he had thus far developed. Flavell put Piaget into better perspective for North American readers, describing him not only as a child psychologist but as an epistemologist. This lengthy book discussed Piaget's interesting experiments in some detail and provided an extensive bibliography. It also supplied a critique of Piaget's studies, noting that he tended to "overinterpret" his data and to "force unwilling data into preset theoretical molds."
- (29) Hans G. Furth, Piaget and Knowledge: Theoretical Foundations (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1969). This well-written and well-rounded introduction to Piaget's theoretical formulations showed the close linkage between psychology and biology in his theory. Furth delved into Piaget's theory of knowledge to a much greater extent than other writers who have tended to interpret his work more as research into child development than as the study of genetic epistemology.
- (30) Herbert Ginsburg and Sylvia Opper, Piaget's Theory of Intellectual Development: An Introduction (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1969). This was an amazingly fast-paced and lucid introduction to the thought and work of a man who, as the authors stated, "is an extremely difficult writer." Ginsburg and Opper traced an account of his many years of research activity. They explained that his first books set out his theory of intellectual development. Then he began to state these theories in the formal language of logic. Soon he became attracted to the study of children's understanding of scientific and mathematical concepts. Ultimately, his writings began more clearly to bring his psychological theories directly to bear on the study of knowledge in general. The authors' emphasis was on Piaget's child psychology, however, rather than on his genetic epistemology. Their description of his work, intended

for undergraduate university students, was highly favorable and uncritical.

- (31) Jean Piaget, "Autobiography," in Edwin G. Boring, et. al., eds., A History of Psychology in Autobiography (Worcester, Massachusetts: Clark University Press, 1952), Vol. IV, pp. 237-256. Piaget offered an excellent picture of his own view of his work as a psychologist and epistemologist, including an explanation of the shortcomings of his early research. These first studies were The Language and Thought of the Child (1924), Judgment and Reasoning in the Child (1924), The Child's Conception of the World (1926), The Child's Conception of Causality (1927), and The Moral Judgment of the Child (1932). It was his early life experiences, he wrote, that "made me decide to consecrate my life to the biological explanation of knowledge." He sought to study the development of thought as he had studied the development of mollusks. "My one idea, developed under various aspects in (alas!) twenty-two volumes, has been that intellectual operations proceed in terms of structures-of-the-whole. These structures denote the kinds of equilibrium toward which evolution in its entirety is striving; at once organic, psychological and social, their roots reach down as far as biological morphogenesis itself."
- (32) Jean Piaget, "Development and Learning," Journal of Research in Science Teaching, II (September, 1964), pp. 176-186. Piaget made this presentation in March of 1964, first to a group of fifty educators, psychologists, and subject matter specialists at Cornell University and then to a similar group at the University of California at Berkeley. In it he described his philosophy of development and his philosophy of learning. He summed up his analysis of implications of the research for which he had become famous. The presentation provides the practitioner with an excellent precis of the thinking of Piaget.
- (33) Jean Piaget, Genetic Epistemology (New York: Columbia University Press, 1970). In a series of difficult but brief lectures, Piaget put his findings in child psychology into the context of his theory of genetic epistemology. He pointed out that this theory deals with both the formation and meaning of knowledge. His fundamental hypothesis, he indicated, assumes a parallelism between the history of progress in the logical and rational organization of knowledge and the corresponding formative psychological processes in the individual. By studying the development of the child, he hoped to learn how man's knowledge and thinking have developed from pre-historic times to the present.
- (34) Jean Piaget and Barbel Inhelder, The Growth of Logical Thinking from Childhood to Adolescence (New York: Basic Books, 1958). This study combined Barbel Inhelder's empirical research into adolescent reasoning with Piaget's formal logic-based analysis. "...While one of us was engaged in an empirical study of the transition in thinking from childhood to adolescence," Piaget wrote,

"the other worked out the analytic tools needed to interpret the results." The book sought to describe the changes in "logical operations" between childhood and adolescence and "to describe the formal structures that mark the completion of the operational development of intelligence." A lengthy report full of logical symbolism, the book clearly was meant for the professional researcher.

- (35) Jean Piaget, The Origins of Intelligence in Children (New York: International Universities Press, Inc., 1952). This was a lengthy and involved description by Piaget of his theory of the development of intelligence in children.
- (36) Jean Piaget, The Psychology of Intelligence (London: Routledge and Kegan Paul, Ltd., 1964). This book provides the student and practitioner of adult education with a concise source of Piaget's thought regarding his theory of intellectual development. In it he refuted the teachings of other schools of psychology on this subject. It must be noted that it does not offer easy reading for one lacking background in psychology.

A Few Other Writings Regarding Conceptual Learning

- (37) Marilynne J. Adler, "Some Educational Implications of Jean Piaget and J.S. Bruner," Canadian Education and Research Digest, IV (December, 1964), pp. 291-305, and V (March, 1965), pp. 5-13. The author discussed the work of Jean Piaget and compared and contrasted it with that of Jerome Bruner. She pointed out that Piaget's research emphasis has been on development and intelligence growth in children, while Bruner's research began with concept attainment and problem-solving in adults (college undergraduates) and then turned to the applicability of his findings to children. In Piaget's work, she noted, one can get an analysis of concept formation, while Bruner deals more with concept attainment, i.e., the modification and adaptation of existing concepts to new uses.
- (38) D.E. Berlyne, Structure and Direction in Thinking (New York: John Wiley and Sons, Inc., 1965). Berlyne sought to explain thinking in terms which would preserve some semblance of Stimulus-Response learning theory, a difficult task. His book also provided a most readable analysis of S-R theory.
- (39) Earl B. Hunt, Concept Learning (New York: John Wiley and Sons, Inc., 1962). This difficult book ambiguously defended the value of Stimulus-Response learning theory in concept development. The author looked forward to the time when computers could be used "for discovering concepts." Until then, however, "there is no objection to including a human being as one of the components of a problem-solving device. He is still the best concept learner available, and will be for some time."
- (40) Herbert J. Klausmeier and Chester Harris, Analyses of Concept

Learning (New York: Academic Press, 1966). This collection of papers was presented at a Conference on Analyses of Concept Learning in October of 1965. Despite its seeming promise, this was a most disappointing source of information.

- (41) Herbert J. Klausmeier, et. al., Concept Learning: A Bibliography, 1950-1967, Technical Report No. 82, Madison, Wisconsin: Center for Cognitive Learning, April, 1969. Supplementary Technical Papers Nos. 107 (November, 1969), 120 (March, 1970), and 147 (November, 1970). This is the best bibliographical source for readers of this literature review interested in delving widely into the research regarding conceptual learning. The vast quantity of materials produced in this area since 1950 was identified and screened. Most of the pertinent studies through 1969 made it into the listing or its supplements. Many of the studies included were conducted with adult subjects. The Center has indicated its intention to continue issuing occasional supplements to update the bibliography. It should be noted that the listings were compiled by a group committed to the theory and technique of conceptual learning. A major drawback in this publication is its lack of annotations.
- (42) Philip H. Phenix, "Key Concepts and the Crisis in Learning," Teachers College Record, LVIII (December, 1956), pp. 137-143. This is perhaps the most brief and most lucid advocacy extant for the value of conceptual learning. Phenix described the problem for which he prescribed conceptual learning as a solution in terms of a need for more efficient education in a time of crisis. The crisis he saw as an explosion or profusion of knowledge which no one individual could any longer absorb properly. Education's response, he believed, had been to turn out the specialized man since it could not produce the complete man of breadth. The result of such a response, he charged, was a narrowness that endangered the survival of civilization. Conceptual learning, he argued, provided the most economical way of organizing the vast array of knowledge to meet what he described as the primary aim of education -- "to minimize the disparity between available knowledge and ability to know."

Conceptual Learning in the Schools

- (43) A.L. Benosky, "Induction, Discovery, and the Conceptual Approach in Social Studies," New York State Education, LV(February, 1968), pp. 26-28.
- (44) J. Concannon, "Concept Development in Kindergarten," The Catholic Educational Review, LXVI (November, 1968), pp. 516-522.
- (45) M.L. Coulter, "Concept Development and Reading Instruction," Education, LXXXVI (April, 1966), pp. 490-493.

- (46) R.E. Hendricks, "Concept Development in Science," Education, LXXXVII (December, 1966), pp. 195-198.
- (47) G.H. Henry, "Teaching Literature by Concept Development," English Journal, LVII (December, 1968), pp. 1297-1306.
- (48) G. Hubbard, "Conceptual Learning in Preparation of the Teacher of Art," Art Education, XVII (June, 1964), pp. 10-13.
- (49) J. Jarolimek, "Conceptual Approaches: Their Meaning for Elementary Social Studies," Social Education, XXX (November, 1966), pp. 534-536.
- (50) E.B. Jones, "Conceptual Approach to Health Education for College and Universities," The Journal of School Health, XXXVIII (January, 1968), pp. 36-44.
- (51) R.A. Kiekhefer, "Conceptual Teaching of Latin," The Catholic Educational Review, LXII (November, 1964), pp. 517-520.
- (52) L.J. Meconi, "Concept Learning and Retention in Mathematics," The Journal of Experimental Education, XXXVI (Fall, 1967), pp. 51-57.
- (53) J.L. Nelson, "Concept Unit in the Social Studies," The Social Studies, LVI (February, 1965), pp. 46-48.
- (54) J. Rosenstein, "Concept Development and Language Instruction," Exceptional Children, XXX (April, 1964), pp. 337-343.
- (55) M.F. Roskopf, "Strategies for Concept Attainment in Mathematics," The Journal of Experimental Education, XXXVII (Fall, 1968), pp. 78-86.
- (56) W.L. Schaaf, "Scientific Concepts in the Junior High School Mathematics Curriculum," School Science and Mathematics, LXV (October, 1965), pp. 614-625.
- (57) J.L. Stewart, "Conceptual Approach to Teaching Design and Drafting," Industrial Arts and Vocational Education/Technical Education, LVII (April, 1968), pp. 29-32.
- (58) W.V. Tinsley and M. Sitton, "Teaching Intellectual Aspects of Home Economics Through the Identification of Basic Concepts," Journal of Home Economics, LIX (February, 1967), pp. 85-88.
- (59) A.D. Woodruff, "How Music Concepts are Developed," Music Educators Journal, LVI (February, 1970), pp. 51-54.

The Literature on How to Teach via the Conceptual Learning Theory and Technique is amazingly limited in the light of so much research and advocacy. Most of the literature on how to teach by means of conceptual learning stops with the ferreting out of specific concepts which purportedly form the structure of a given subject matter. There is little literature on how the identified concepts can best be taught. Along with the items

listed in this section, reference may also be had to some of the articles listed earlier under "Conceptual Learning in the Schools."

- (60) John B. Carroll, "Words, Meanings and Concepts," Harvard Educational Review, XXXIV (Spring, 1964), pp. 178-202. "I suspect that anyone who has examined the concept formation literature with the hope of finding something of value for the teaching of concepts in school has had cause for some puzzlement and disappointment," Carroll wrote, "because however fascinating this literature may be, as it winds its way through the detailed problems posed by the methodology itself, its relevance to the learning of concepts in the various school subjects is a bit obscure."
- (61) John P. DeCecco, The Psychology of Learning and Instruction: Educational Psychology, Chapter 10, "The Teaching and Learning of Concepts and Principles" (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1968), pp. 385-427. This chapter presented a mechanistic nine-step formula for teaching "desirable" concepts and an equally mechanistic eight-step approach for teaching principles.
- (62) Robert M. Gagne, The Conditions of Learning (New York: Holt, Rinehart and Winston, 1965). Gagne prepared this textbook to present his explanation of the process of learning in hopes that it might be used to help make educational programs more efficient. He suggested that eight different kinds of learning exist, ranging in level from signal learning and stimulus-response learning at the lower end of the scale to such higher order activities as concept learning, principle learning, and problem solving. Achievement of these higher order generalizations, according to Gagne, depends upon the learner having achieved each of the lower order levels of learning. Gagne sought to clarify some of the language of conceptual learning by discriminating between concept learning and the learning of principles, a term he defined as chains of two or more concepts.
- (63) Mary S. Gibbs, et. al., eds., Family Finance Education: An Interdisciplinary Approach, Vol. I. (Terre Haute, Indiana: Indiana State University Center for Education in Family Finance, 1967). This first of two volumes presented school curriculum development as it relates to family finance and background for money management. An interdisciplinary approach was used, based on philosophy, sociology, and psychology. Part I dealt with general curriculum planning, concept formation, establishing behavioral objectives, overview of curriculum patterns, processes and procedures, and evaluation of family finance education. It emphasized that students should be able to evaluate the worth of what they learn and make sound decisions about earning and spending of money. Individual differences must be considered as well as utilization of appropriate materials and resources. Family finance can be integrated into established curricula of home economics, economics, history, sociology, geography, health, language arts, or any combination of these subjects.

Part II discussed economic education, psychological implications of money management, sociological factors related to money management, and decision-making from a family unit point of view.

- (64) Herbert J. Klausmeier and William Goodwin, Learning and Human Abilities, Chapter 7, "Factual Information and Concepts" (New York: Harper and Row, 1966), pp. 211-255. The authors suggested practical approaches for teaching children both facts and concepts.
- (65) New York State Education Department, High School Equivalency: English Language Curriculum Resource Handbook (Albany, N.Y.: Bureau of Continuing Education, 1970). This English language curriculum resource handbook provided background information and techniques of instruction designed for instructors helping students to prepare themselves for the General Educational Development Tests in general language and literary abilities. It emphasized fundamental concepts and techniques useful in developing these concepts. Included were ninety-nine sample test questions, an annotated list of instructional materials (textbooks, workbooks, and review books), and the addresses of the publishers.
- (66) New York State Education Department, High School Equivalency: Science Curriculum Resource Handbook (Albany, N.Y.: Bureau of Continuing Education, 1970). This science curriculum resource handbook provided background information and techniques of instruction designed for instructors helping students to prepare themselves for the General Educational Development Test in general science ability. Consisting largely of fundamental concepts which high school graduates are expected to retain, the publication also included some techniques of use in developing these concepts.
- (67) New York State Education Department, High School Equivalency: Mathematics Curriculum Resource Handbook (Albany, N.Y.: Bureau of Continuing Education, 1970). This mathematics curriculum resource handbook provided background information and techniques of instruction designed for instructors helping students to prepare themselves for the General Educational Development Test. It consisted largely of fundamental concepts which high school graduates are expected to retain, together with some techniques of use in developing these concepts. Two specific approaches to the presentation of mathematics characterized this program. The first was the emphasis placed on the language of mathematics as a unifying concept. The second was the use of manipulative devices. Teachers were urged to use paper constructions, models, and movable figures as teaching techniques whenever possible.
- (68) John L. Phillips, Jr., The Origins of Intellect: Piaget's Theory (San Francisco: W.H. Freeman and Co., 1969). This rather oversimplified explanation of Piaget, intended for the early undergraduate university years, might prove useful to teachers of children in its latter pages in which the author suggested some pedagogical

approaches he thought would be consistent with Piaget's findings.

The Literature of Criticism of the conceptual learning approach incorporates two types of writings. There are fundamental criticisms of the work and thinking of Bruner and Piaget. There are also writings in support of these advocates which either decry the loose application of their findings by others or seek to refine their constructs.

- (69) Bernard Z. Friedlander, "A Psychologist's Second Thoughts on Concepts, Curiosity and Discovery in Teaching and Learning," Harvard Educational Review, XXXV (Winter, 1965), pp. 18-38. Friedlander bearded the Harvard lion in his own den by submitting criticisms of the Brunerian approach to this publication.
- (70) Robert M. Gagne, "The Learning of Concepts," The School Review, LXXIII (Autumn, 1965), pp. 187-196. Concerned by the wide variation in education and psychology of the word, concept, Gagne sought to clarify the situation by distinguishing between the learning of concepts and the learning of principles. Concept-learning, he wrote, was the acquisition of a common response, such as a name, for a class of different appearing objects. Principle learning, according to Gagne, was a higher order activity requiring the use of more than one concept.
- (71) G.A. Helmore, Piaget -- A Practical Consideration (London: Pergamon Press, 1969). Acknowledging that Piaget brought his research methodology more into line with psychological research practices after 1936, Helmore still had some serious questions about Piaget's theory and research. He thought it was a mistake for Piaget in explaining learning to emphasize maturation and logical structures over experience, motivation, and teaching. He also questioned Piaget's structured experimental designs, preferring to study a child's development in more of a natural setting.
- (72) Jurgen Herbst, "Reflections on Teaching," address given at a meeting of the American Educational Research Association, Minneapolis, Minnesota, February, 1970. (For further information, write to R.A. Carlson, Associate Professor of Continuing Education, College of Education, University of Saskatchewan, Saskatoon, Saskatchewan, Canada.) Acknowledging that Jerome Bruner's approach to education was "a health corrective to the absurdities of life adjustment," Herbst went on to suggest that Bruner's theory of instruction also contained absurdities. Brunerian thought, Herbst noted, rested "squarely on the assumption that the scientific way of confronting and evaluating life is the most desirable one for all who live in the twentieth century." The absurdity in such an approach was evident, Herbst indicated, since "men differ legitimately in their aims and aspirations." Herbst advocated a "salutary . . . skepticism towards scientific gospels" and all the other gospels urged upon educators.

- (73) K. Lovell, "A Follow-up Study of Inhelder and Piaget's The Growth of Logical Thinking," British Journal of Psychology, LII (May, 1961), pp. 143-153. Lovell sought to replicate the Piaget-Inhelder study. While paying tribute to the investigators as having contributed important insights regarding conceptual learning, Lovell reported that "overall it would seem that the authors have somewhat forced the development of the child's thinking into a theoretical framework."
- (74) Richard F. Newton, "Concepts, Concepts, Concepts," Social Education, XXXII (January, 1968), pp. 41-42. Newton seemed to accept the notion of conceptual learning but felt it was fast becoming meaningless as great numbers of educators carelessly tossed around the language associated with it. "It seems that periodically certain bits of jargon sweep through the field of education," he wrote, "with the fervor of a raging forest fire. . . Today we once more are adopting a new word for our vocabulary -- concept."
- (75) Ralph H. Ojemann and Karen Pritchett, "Piaget and the Role of Guided Experiences in Human Development," Perceptual and Motor Skills, XVII (December, 1963), pp. 927-940. The authors reported research they thought might have relevance to the "recent revival of interest in Piaget's work on the development of concepts." Their experiments with a planned sequence of experiences for children had achieved results which opened to considerable question the emphasis they believed Piaget put on the internal unfoldment in children of structures in a set order. They concluded that Piaget's theory of development tended to ignore antecedent conditions and environmental variables to too great an extent in favor of the importance of the unfolding of internal structures.
- (76) Charles Parsons, "Inhelder and Piaget's The Growth of Logical Thinking: A Logician's Viewpoint," British Journal of Psychology, LI (February, 1960), pp. 75-84. The reviewer expressed serious questions regarding the logic of the book. He complained of the writers' ambiguity and their failure to use the language of the discipline of logic in a precise manner. "What fails to make logical sense can hardly make psychological sense in a study of intellectual development," he wrote. Parsons seriously questioned the generalizability of the findings of the authors.
- (77) Henry J. Perkinson, The Possibilities of Error: An Approach to Education (New York: David McKay Co., Inc., 1971). Bruner's emphasis on transmitting or encouraging the "discovery" of expert-determined key concepts of each subject matter field, according to Perkinson, "reduces education to learning: learning theory becomes the basis for the educational process." Perkinson argued that education should proceed, instead by means of critical dialogue. " . . . The critical approach I am advocating," Perkinson wrote, "is rooted in human fallibility with its recognition that we can

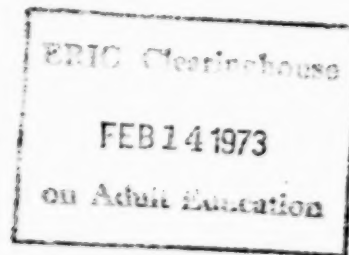
never prove that our ideas are right, or our actions good, or our solutions correct; we can only discover what is wrong with them -- via criticism." He believed strongly that his critical dialogue approach had more potentiality than Bruner's conceptual learning for going "beyond mere learning" to the achievement of improvement of knowledge.

- (78) David Smith, "Developmental Tasks and Adult Education," Continuous Learning, V (July-August, 1966), pp. 179-182. This powerful criticism of Robert Havighurst's theory of the developmental tasks of adulthood threw into question the relevance of a developmental approach to adults. Smith convincingly demonstrated that the so-called developmental tasks were bound to Havighurst's own middle-class American culture. "To read the list of stages and tasks is to read an apologia for American society rather than an outline of educational theory," Smith wrote. He further excoriated Havighurst for ignoring the internal life of the adult. "All his standards are external and culturally determined." The 'neat sequence of 'tasks' Mr. Havighurst outlines" have little relevance, Smith showed, to the training of adult educators. Training instead should emphasize, Smith suggested, a more creative, responsive, and sensitive approach. "It is a sad commentary on the state of educational theory," he added, when such a mechanistic model "should have been accepted by so many as a contribution to adult education thinking." Although Smith took aim solely at Havighurst's theory, it might be well for practitioners of adult education to recall these criticisms whenever they are asked to adopt approaches recommended by developmentalists such as Piaget or Bruner. It may be necessary to guard against a possible detrimental, culture-bound influence when the developmental approach is carried to the adult level.
- (79) Edmund V. Sullivan, Piaget and the School Curriculum: A Critical Appraisal (Toronto: The Ontario Institute for Studies in Education, Bulletin No. 2, 1967). Sullivan provided a meaningful analysis of the tentative state of Piagetian psychology. This booklet offers the practitioner some good cautionary advice about Piaget's theory which Sullivan's colleague at O.I.S.E., David Ausubel, described as being well on its way to "becoming the outstanding fad of all time" in education.
- (80) Andrew T. Weil, "Harvard's Bruner and His Yeasty Ideas," Harper's Magazine, CCXXI (December, 1964), pp. 81-86 and 89. This excellent, balanced analysis of Bruner and his work ultimately came down in favor of Bruner but mostly because of Weil's deep bias against professional educators. "Most of what Bruner says is worth saying" -- despite much mediocrity in it, Weil wrote, because "in a field where unmitigated nonsense has often emerged triumphant, he is unmistakably a force for enlightenment." Weil's point was that in recent years Bruner was one of the few people respected in many

academic disciplines who seemed able to communicate with his fellow scholars as well as with schoolmen regarding questions of pedagogy. "

The Literature of General Background will help the practitioner and administrator of adult education to get an overview of developments in conceptual learning through the years.

- (81) L.S. Hearnshaw, "The Psychological Study of Conceptual Thinking," The British Journal of Psychology, XLV (February, 1954), pp. 1-6. Hearnshaw briefly traced an overview of conceptual learning, its background, its seminal literature, and its major issues up to 1954.
- (82) J. McV. Hunt, Intelligence and Experience (New York: The Ronald Press Co., 1961). Hunt sought to describe and synthesize in relatively non-technical language those developments in psychology which he believed were 'leading to an important reorientation in both theory and practice.' He took Piagetian thinking to what Piaget has termed its "American" extreme in seeking to modify central structures to "increase the rate and the final level of intellectual capacity over the rate and level common under existing circumstances. In so doing Hunt showed clearly the sort of uses behaviorism is prepared to make of the theories and techniques enunciated by such relatively humanistic scientific researchers as Bruner and Piaget.
- (83) Gilbert Sax, "Concept Formation," in Robert L. Ebel, ed., Encyclopedia of Educational Research (New York: The Macmillan Co., 1969), pp. 196-205. This was a brief but helpful overview of research through the years into concept formation.



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